"KNOWLEDGE MANAGEMENT AND E-LEARNING ARE TWO SIDES OF THE SAME COIN"

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Abstract. Working in this knowledge era gives us an appreciation for the continuous, dynamic state of change all around us. To survive and prosper, we must adapt our organizations to the speed of this change. In a knowledge-centric enterprise, intellectual capital is discovered through collaboration in the social context of community. This intellectual capital is measured and harvested as elements of an organizational learning cycle. Re-distribution of the knowledge across the enterprise occurs via the process of e-learning.

Keywords. Knowledge Management. Knowledge-sharing. Knowledge-Centric Organization. Community of Practice. Intellectual Capital. E-Learning. Learning Organization.

INTRODUCTION

"By 2003, 70 percent of enterprises implementing knowledge management will link it with e-learning technically and organizationally." This is the word from the Gartner Group, a leading research and consulting firm. (Aldrich, 2000)

We're seeing the convergence of knowledge management and learning – and today it has become e-learning -- although the technical systems markets which enable both knowledge management and e-learning are still fragmented. The International Data Corporation predicts that the worldwide market for KM software will expand from $1.4 billion in 1999 to $5.4 billion in 2004. The marketplace for vendors providing e-learning software and content is unpredictable at present.

Let's review this prediction of convergence by analyzing it from the organizational point of view. Why do they seem to fit hand-in-glove? Creating, capturing, organizing and making knowledge available for "free" or no-cost re-use is easy to understand. It fits in with the new economy businesses that increasingly trade on the value of the collective knowledge of their employees. Knowledge is an internal product. It's an asset, and is now looked upon as intellectual capital. Making sure it's shared and made available to "knowledge workers" makes good business. This is acceptable. But that's just "side one".

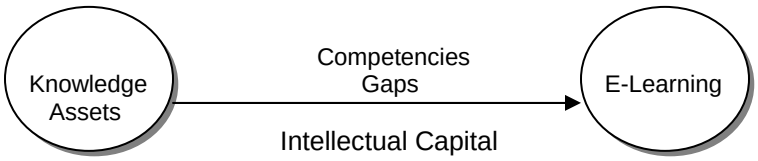
The flip side of the coin is that more organizations are seeing the need to proactively *harvest* the discovery of this knowledge for on-going distribution through e-learning. This is a part of good "management" of this knowledge – to extract all that we can from the investment in the people who create and collect it. The collection of knowledge occurs through collaborative work processes in communities of employees who willingly share information in order to smooth out their work problems. They make continuous productivity improvements. These nuggets of productivity are measured, and this makes up the intellectual capital that is the real value of today's organizations engaged in e-business.

One important consideration is that access to the corporate knowledge-base is made absolutely easy-to-reach. The technology for information retrieval must be engaged to enable employees to effortlessly retrieve all the information they need, when they need it. This may mean that computer applications to which permission to access was not previously granted are made available for the first time to the universe of the corporation. Information retrieval and dissemination must be a seamless process.

Dissemination of information through "training" is boring, and not guaranteed to be effective. It's too slow, and too big. It often doesn't "take". We lose two-thirds of it a day or two after the experience. We retain one-third of it for only a couple of weeks – unless we put it into practice right away. Not only that, even one full day away from our e-mail and scheduled meetings makes it burdensome to come back to our desks, even if the topic is something we know we need to know about.

But if training, as in stand-up training, is old, e-learning is new. It fits with the way we learn today. Learning, and e-learning in particular, is the vehicle with which to ensure that the spiral of learning in an organization is continuously adding value to its members, and to the collective knowledge of the organization. Electronic technology provides compelling scalability and cost savings. It's easy – we learn, and we may even have fun doing it. It's quick, short, and if it's targeted directly at our needs, and delivered just-in-time, or on-demand, we assimilate it almost without thinking about it.

Is there a hidden value in this coin that we haven't fully recognized? The practice of knowledge-sharing reveals and expands our individual and corporate competencies. Once we understand what they are, we can reinforce and redistribute these competencies via e-learning -- and we can address any gaps or weaknesses along the way. This can be extremely valuable to a knowledge-centric organization, the learning organization.



THE KNOWLEDGE-CENTRIC ORGANIZATION

If We Only Knew What We Know. Becoming a knowledge-centric organization starts with first finding out what it is that we know. Lew Platt, former CEO of Hewlett-Packard said, "If HP knew what HP knows, we would be three times as profitable." (Davenport and Prusak, 1998)

Why concern ourselves with this now? Because we must. We are in the midst of great change. This is the knowledge era. We're beyond the industrial age, and we're slipping off the edge of the information age into the knowledge age. For the private sector, it's e-commerce. Being first to market – to make the market. Maintaining a competitive edge. For the government sector, it's e-government. Serving customers over the Web.

Business decisions must be made in quick-time, and they must be right. Decisions must be made at lower levels of the organization. Decisions must be made to resolve issues for which there may be no precedent. Decisions must be made daily, or hourly, by people in the organization who may never have had to make them before. They may never before have had the knowledge (information turned into action) with which to make decisions *at their fingertips.*

Every organization practices knowledge-sharing. We always have. Today, it's the conscious "management" of the knowledge that is different. We practice the process of sharing knowledge, but as we create, capture, store and distribute knowledge, we can be said to be *managing* it. Now it becomes our intellectual capital. It has great value. Many technical organizations, for example, "are what they know." The collective knowledge of their employees is where innovation stems from.

The American Productivity and Quality Center in Houston, Texas, a 20-year old organization that specializes in providing benchmarking studies to sponsoring corporations, searches out the "best of breed" organizations to benchmark against. Their "roadmap" to knowledge management in Figure 1 illustrates five distinct stages that occur in the implementation of knowledge management.

APQC Roadmap to Knowledge Management
Results: Stages of Implementation

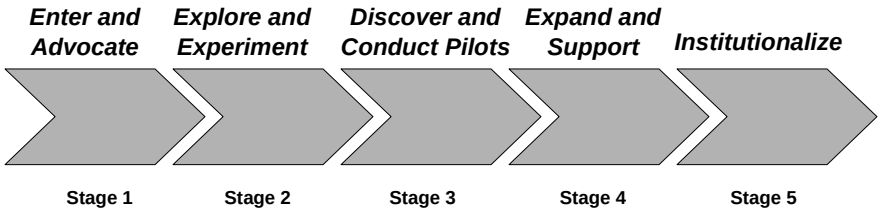


Figure 1. Stages of Implementation for a Knowledge Management Program

Stage 1 – Advocate the KM concept, and find other "champions".
Stage 2 – Explore Communities of Practice and other KM pilot initiatives.
Stage 3 – Search for the value proposition and establish pilots.
Stage 4 – Expand the pilots and implement a KM Program.
Stage 5 – Institutionalize KM – become a learning organization.

In the important Stage 3, "Discover and Conduct Pilots", before deployment of KM across the organization, Carla O'Dell, president and CEO of APQC, advises us to find our organization's "value proposition". In order to be able to measure results and demonstrate the value of knowledge-sharing to the organization, we first establish pilot knowledge management initiatives. To anticipate significant business improvement possibilities, we create pilot issues around issues with the highest pain, or gain.

Pilots often consist of establishing "Communities of Practice". A Community of Practice, or CoP, is "a group of people who care about a common set of issues, share and develop knowledge in that domain, and thus steward a competence critical to the success of the organization." (Wenger, 2000) The members of the community collaborate with one another to share knowledge to resolve business problems, avoid redundant processing, and make work easier and more productive.

Continuous improvement is the result, and this can be measured. The "Best Practices" or success stories of these communities are shared with others, and innovation is recognized and rewarded. "Lessons Learned", or how not to perform a task, are also shared, with no retribution.

Regarding the adoption of knowledge-sharing as an integral part of their mission, Steve Denning, the former program director for knowledge management at The World Bank, states that the turning point for the bank came only when it was understood that "Communities of Practice are the heart and soul of The World Bank." (2000)

COLLABORATIVE COMMUNITIES

A close inspection of Figure 2, Nonaka's knowledge-creating organization structure, shows us how collaborative work naturally moves knowledge freely throughout the organization.

Collaboration is key. In 1995, in *The Knowledge-Creating Company*, Nonaka began to define the importance and necessity of the collaboration of work to bridge over the functional departments and data "silos" (in stand-alone, self-contained business departments and computer applications) in organizations. He was looking for the ideal organizational structure, and he found it in what he called a bottom-up and top-down structure. This insight came from his understanding of why the Japanese lost the Second World War.

The U.S. Marines defeated the Japanese due to a flexible "task force" structure that they superimposed over the standard military hierarchical organization structure. Nonaka felt that this made the difference in the outcome of the war. It gave the United States a flexibility that it hadn't had before the victory at Guadalcanal. It served to confound the Japanese military, which hadn't made any changes in their war-fighting organizational structure for centuries. And the Marine task forces provided the United States with the momentum to win the war.

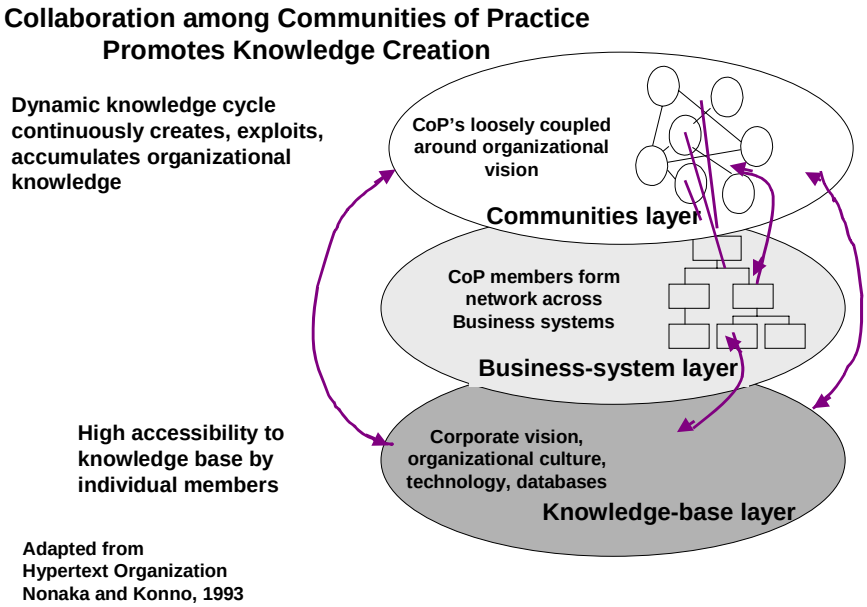


Figure 2. Collaborative work moves knowledge freely

Nonaka's original design incorporated the Marine task force example for the top layer. However, we can see that Communities of Practice fit this model. They operate independently, but they can communicate with other communities in the Communication Layer. They also operate through the Business-system layer to bring knowledge back to

the individual departments to which they belong. They infuse the knowledge base of the organization with innovative information that they create and then deposit, and with the information that they take away, recreate, and re-deposit for the benefit and use of the whole organization.

Communities experience the confluence of work – regardless of organizational hierarchies or distance boundaries. They engage in it because it makes their work easier. They find solutions together in an open, collegial atmosphere.

A Culture without Boundaries. Jack Welch, Chairman and CEO of the General Electric Company, in his Annual Report for 1999, talks about GE's "social architecture".

> "In the early '80's . . . we became convinced that the only way a company like ours could move quickly and successfully through times of radical change was to use every mind in the Company and to involve everyone in the game – to leave no one, and no good idea, out.
>
> "The second facet of the social architecture which GE embraced involved the "cultivation of what we call 'boundaryless' behavior by the removal of every organizational and functional obstacle to the free and unimpeded flow of ideas – inside the Company across every operation, and outside the Company from the best thinking in world business."

Knowledge management experts Cohen and Prusak agree that without positive social capital in an organization – trust, personal networks, a sense of community – cooperation and productive work between the employees often doesn't take place as expected. People need time to connect, and social spaces in which to meet.

While we understand that knowledge is developed and distributed through social networks and communities, managers need to proactively support the ability of employees to draw on the expertise of others. Encouraging voluntary communities rather than mandating them is important. Self-directed informal communities certainly already exist in organizations, with members drawn together by shared passion for their subject. These often go unrecognized by management, yet they powerfully create and manage knowledge, enforce social norms, encourage commitment, and create more democratic workplaces. (Cohen, 2001)

It's the "practice" of the community that counts. Newly minted lawyers may have been taught much of the methods about good lawyering, but they haven't had the practice. There are gaps in their knowledge. Practice is an effective teacher, and the *community of practice* is an ideal learning environment. After years of schoolroom training, doctors, lawyers, architects and scientists learn their craft in the company of professional mentors – from their colleagues in the organization. (Brown, 2000)

MEASURING INTELLECTUAL CAPITAL

If KM is on one side of the coin, and E-Learning is on the other side – how do we measure the value of the coin itself? The knowledge of an organization comprises its

intellectual capital. Intellectual capital is defined as knowledge, information, intellectual property, experience -- that can be put to use to create wealth. (Stewart, 1997)

This collective brainpower includes the competencies of individual employees, which, when combined with the shared competencies of others, forms the "tacit" knowledge known by individuals. Tacit knowledge, combined with the "explicit" knowledge of documents, policies, processes and patents, for example, become the knowledge quotient of the organization.

- What do we know, and where is it?
- Who needs to know it, and when?
- How do we get it there?
- How do we use it for corporate gain?

One way to create corporate gain in this knowledge economy is to build organizational capability *ahead* of market demands. If you build competencies in front of customer demands, you may have the opportunity to shape and build the market. This idea was expressed by Hubert Saint-Onge, Senior Vice President of Strategic Capabilities at Clarica, Canada's largest financial services firm, speaking at an E-Learning conference in January 2001. Instead of following the market, you consider *leading* the market by growing your intellectual assets faster than the growth of the market. You then are in a position to influence the market to favor your own organization's strengths and capabilities.

Growing the knowledge assets of an organization helps to transform it into e-business readiness. Learning at both the individual and the organization level facilitates change and the transformation required to perform well in the knowledge economy. Employees who are continually learning are more accepting of continuous change.

Two Examples of Measurement. Raising the level of the intellectual capital of your organization – and being able to measure it – is the name of the game. Two methods prevail. Kaplan and Norton have updated their important 1992 study that produced the "Balanced Scorecard," a method of measuring performance that includes the ability to monitor both qualitative and quantitative improvements. For example, you measure from four perspectives: financial outcomes, internal business operations, customer service, and learning and growth. To many organizations the importance of customer service is prime, contributing to customer loyalty and repeat business. Realization of customer satisfaction goals is influenced by the quality of employee learning and growth.

In their new book, *The Strategy-Focused Organization*, Kaplan and Norton have wisely re-purposed their theory, which today focuses on "managing knowledge-based strategies that deploy an organization's *intangible* assets." The management control paradigm has given way to a long-term strategic view centered on the alignment and focus of an organization to create breakthrough performance – to tie action back to strategic goals.

Five key principles are required for the building of the "strategy-focused organization". They are: 1) translate strategy to operational terms; 2) align the

organization to the strategy; 3) make strategy everyone's everyday job; 4) make strategy a continual process; and 5) mobilize change through strong effective leadership.

A second framework used to measure newly appreciated knowledge assets is Skandia's "Intellectual Capital Navigator". Skandia, located in Sweden, is a global corporation concentrated in insurance and financial services. The responsibility for the measurement and growth of intellectual capital (IC) is a corporate function. IC consists of both human capital (the knowledge and experience of the corporation's employees), and structural capital, the infrastructure that supports the human capital.

Knowledge sources are identified in five focus areas: Financial, representing the results of the past, and Customer, Human, and Process, indicating the present situation. The fifth focus is on "knowledge navigation for future earnings", which is based on the corporation's strategic use of knowledge. Each of these focus areas contains specific quantitative measurements called "IC Indicators." (Von Krogh, Ichijo, and Nonaka, 2000)

Once the sources of knowledge have been identified and measured, Nancy Dixon's approach to active promotion of the growth of this intellectual capital makes sense.

HARVESTING INTELLECTUAL CAPITAL

Nancy Dixon defines organizational learning as "the intentional use of learning processes at the individual, group and system level to continuously transform the organization in a direction that is increasingly satisfying to its stakeholders." (1999) The elements of an organizational learning cycle are depicted in Figure 3.

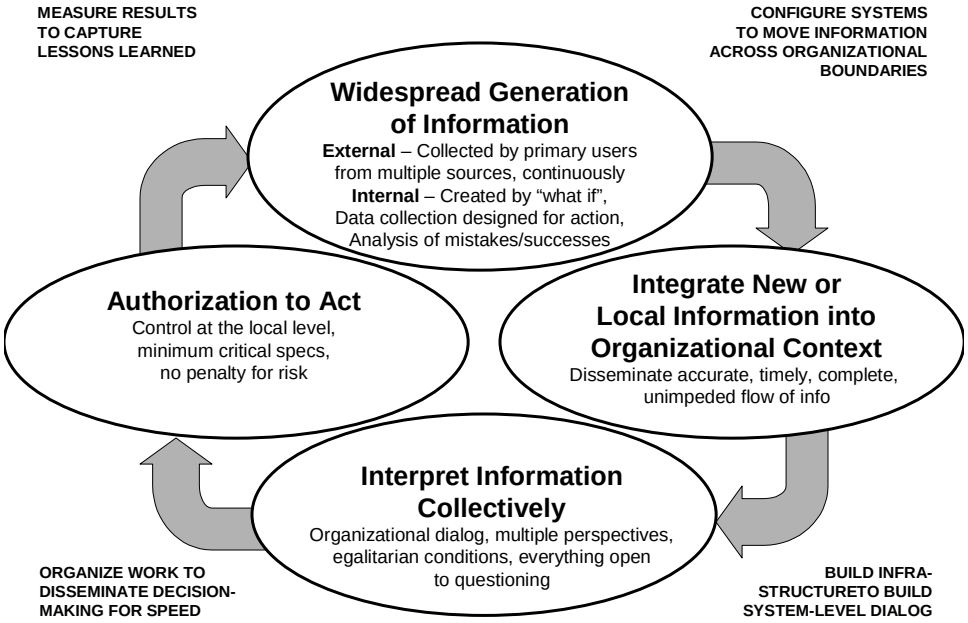


Figure 3. Elements in the Organizational Learning Cycle **Adapted from Dixon,1999**

It is the "intentional" proactive approach to the process that makes the difference. We don't take a laissez-faire or hit-or-miss approach to this learning process. Rather, we see it as a dynamic course of continuous transformation that bears tangible benefits. Information is widely generated, and is integrated into a local organizational context where it is appreciated for its value for use. It is interpreted for specific use and then acted upon.

Dixon's concept of organizational learning is best viewed as a *collective* activity, supporting the new collaborative viewpoint. This is different from the former emphasis on learning for the sake of the individual alone.

So, how do we get the information with which to make actionable knowledge to shape successful, on-time decision-making? We begin to map out the sources of our corporate knowledge to locate and recognize competencies, and define the gaps, so that we can fill them.

We take advantage of "Yellow Page" directories of subject matter experts who offer to share their expertise with others in the organization. This is often the first step to illustrate and break down the artificial barriers of "silo" or stand-alone functional departments, and their corresponding department-developed mission-critical computer applications that have not provided crosswalks from one system to the other.

We measure, celebrate, and recognize the knowledge creation and "best practice" successes of the communities. We are open to understanding that honest descriptions of "lessons learned", without retribution, are requisite to uncovering our corporate weaknesses and mitigating risk.

We "pull" the information to us from our Intranet or from the Web, or it may be "pushed" to us by the corporation. We find the information from our vast warehouses of explicit data (un-patterned) and information (patterned data), which we search to find a meaningful nugget that we can trust to become the solution to a business problem. We organize our enterprise information portal – our personalized Intranet door to the *explicit* information resources we need on a daily basis – to reflect the reports we regularly follow, the hot news happening in our organization, or the major events occurring in our larger environment that includes our customers and stakeholders.

We talk to our colleagues to garner and update the *tacit* information that we share with each other -- in person, by phone, e-mail, FAX, and in on-line "virtual" communities. Of course, we specifically capture the valuable tacit knowledge from long-term employees ready to retire. And we keep our employees happy – we don't want our intellectual capital assets so carefully planted and watered to be able to walk out the door and be harvested by another organization.

The biggest barriers to knowledge shared across the organization are culture, old habits, and the fact that *information in many organizations is not readily retrievable by all who need it.* It happened naturally enough.

Information Anarchy vs. Information Democracy. In the 1980's and 1990's many organizations moved away from a centralized mainframe environment to a client server environment with powerful PC's on every desktop. While the mainframe transacted the data processing for the whole organization, it was now practical for individual departments to build their own departmental information systems. So they did. They processed their own information to match the needs of their own functional responsibilities.

The organization's data assets were now dispersed almost solely within departmental systems. Systems were developed with no consideration of need to share knowledge beyond the boundaries of the department, and development took place on different hardware platforms with different operating systems, making it difficult to later consider the integration of independent systems that now held the organization's information assets – its intellectual capital.

Individual PC end-users were able to manipulate data in spreadsheets and user-friendly databases. These databases became production systems, essential to departmental operations. Another layer of department-specific applications was created without regard to standard testing, change management and security principles. And of course there was often no documentation for these systems.

Individual employees and departments took their information needs into their own hands. This situation is described as "Information Anarchy." (Liautaud, 2000) This allegiance to organizational boundaries serves to stifle and stalemate the learning organization. It promotes knowledge-hoarding, whether a natural or an intended effect. Command and control culture that prizes the sanctity of boundaries to keep information in, and knowledge-sharing out, often foments competition among employees, creating "information haves" and "have-nots," is the enemy of Information Democracy.

"Information Democracy" is the democratic approach to distribute information across the organization to every employee for the purpose of increasing the value of what individuals and the organization can learn. The lack of data access doesn't force employees to make important decisions without the necessary information. With access to accurate information, employees are empowered to make decisions at their own level, without slowing down the decision-making by having to move it up the organization hierarchy.

Even if culture changes that impede knowledge exchange are overcome, Information Democracy takes time and skill to implement. However, the learning organization knows how to make it happen.

DISTRIBUTING INTELLECTUAL CAPITAL THROUGH E-LEARNING

When learning and work become synonymous, learning needs to come out of the classroom and into spaces where work is being conducted. (Dixon, 1999) Today this space is browser-based – either internal (the Intranet) or external (the Internet). This means e-learning.

"The next big killer application for the Internet is going to be education. Education over the Internet is going to be so big it is going to make email usage look like a rounding error." This is the widely-quoted declaration of John Chambers, Cisco's president and CEO. (Muoro, 2000)

Cisco. Cisco is a knowledge and an Internet-centric organization. It clearly puts the "E" into E-Learning. Four-fifths of its sales and technical training is now presented on-line, resulting in savings of 40 to 60 percent in costs, compared to classroom training and related travel. In one year, Cisco converted from conducting 90 percent of learning in classroom lectures to presenting 80 percent on-line. New hires are encouraged to do everything on-line.

Cisco takes knowledge-sharing beyond its own enterprise to its customers, partners and suppliers. As early as 1991, Cisco took the risk of trusting each of these constituencies with information that normally would be held close to the chest. Cisco established a dial-in bulletin board for customers as early as 1992. They transformed a culture of knowledge-hoarding to one of knowledge-sharing by extending trust and moving historically confidential information out to suppliers.

Now the company has opened portals for its customers, its suppliers, and its employees. Cisco also created an Internet business solutions group to bring to customers developing an e-business strategy the "lessons learned" that Cisco experienced. While Cisco sells $50,000 million dollars of product over the Internet each day, it has evolved into a company where knowledge itself is its chief asset.

ACNielsen. ACNielsen is the world's largest marketing-information company, with $1.5 billion in revenue, a presence in 100 countries, and 22,000 associates worldwide.

Their goal? The achievement of a Global Client Service Initiative – an evolution to world-class client service. "KM is crucial to realizing this goal," stated Mary Beth Thornton, (2001) who finds the convergence of KM and E-Learning extremely important.

Their solutions? They conducted 1600 needs assessment interviews with clients worldwide to find out what services their customers desired the most, and then began making plans to "harvest" their volumes of intellectual capital. They deliver knowledge to customers all over the world, and recognize that knowledge is their competitive advantage. They are moving from computer-based training, CBT, to Web-based training, WBT. They expect to transform the ACNielsen University, which is currently based on a regimented, curriculum-based, traditional classroom approach – to move some elements on-line. They find asynchronous (just-in-time and "anywhere") delivery absolutely necessary.

EMC. The EMC Corporation, with a revenue goal of $12 billion for 2001, considers itself "the caretaker of the world's information". Two-thirds of the world's electronic information lives in EMC's data storage systems. Recently, EMC began to look at their training landscape, comprising seven global independently operating training organizations serving 15,000 employees.

Their goals? To "turn the ship around while moving full-speed ahead", stated Susan Sheehan. (2001) To provide a training infrastructure to sustain a yearly revenue growth of 40%, with 10,000 new employees and 22,000 existing staff, to reduce course development time while improving quality, to be able to identify critical skill gaps, and to reduce costs associated with training travel – approximately $2.5 million per year. Their solutions? To provide self-paced "blended training", consisting of a learning portal, with live broadcasts, knowledge recordings, CBT and WBT, virtual classes, simulations, peer discussions and mentoring.

KPMG. In July 1999, Douglas Stefanko of KPMG Consulting, was asked by his CEO to train 8,000 consultants in the concepts and application of e-Business. (2001) This training was considered so important that the CEO announced on August 17th that this learning program was to be on a fast-track schedule, to be completed by October 1999.

Their goal? To create a "Workforce 2000, the premier e-Business solutions and e-Engineering workforce in the market today." Their solution? An e-Business Mobilization Program was designed to ramp up the Web-based training course development and execution. The results? Within four days of the launch, 60% of their employees had registered for the course; this resulted in 95% participation, vs., 40% in the next best program; and 98.6% of employees passed the certification.

The ROI for this event was impressive. Delivering the training cost 20% of the cost of developing a comparative course in the previous year. It was deployed in weeks, instead of years. The productivity loss was a fraction of what it would have been under conventional classroom training, when consultants would not be billing for client work.

There was a marked increase in KPMG's e-Business consulting work, and an e-Learning practice was created as a result.

These four organizations have found that the best way to distribute knowledge to increase the collective knowledge of their respective organizations is via E-Learning. Most important, it provides scalability, i.e., classroom training is a single learning experience for perhaps 30 students, with an instructor. Learning over the Web scales up to an infinite number of learning experiences, delivered at any time, or any place where there is a computer – office, home, or on the road. The learner can stop the learning, as convenient, and then start up again, or can repeat the "class" if something was not understood the first time. The savings in travel and lost productivity is substantial. E-Learning has proven its worth.

SUMMARY

The knowledge era is upon us. Change is becoming a constant. Some of us are just beginning to understand that knowledge is the currency of the new economy. Unless we share and "manage" our knowledge, we'll never "know what we know." E-Learning increases the value of an organization's intellectual capital through the distribution of knowledge across the organization within a democratic, egalitarian culture where unnecessary information boundaries have been eliminated. This intellectual capital is collected through collaboration in the social context of community, and harvested proactively as elements of an organizational learning cycle. It is measured, and every time it is re-used, it adds value to the organization's bottom line. Today's organization is knowledge-focused, and is characterized as a learning organization, because it generates its future as it learns how to grow its most important knowledge assets. Here we have it – the convergence of KM and E-Learning – two sides of the same coin.

REFERENCES

Aldrich, Clark, "The Learning Revolution", Gartner Symposium, IT XPO 2000, Orlando, Florida, October, 2000.

Brown, John Seeley, and Duguid, Paul, *The Social Life of Information, Harvard Business School Press, Boston*, 2000.

Cohen, Don, and Prusak, Laurence, *In Good Company: How Social Capital Makes Organizations Work*, Harvard Business School Press, Boston, 2001.

Davenport, Thomas H. and Prusak, Laurence, *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press, Boston, 1998.

Denning, Stephen, *The Springboard: How Storytelling Ignites Action in Knowledge-Era Organizations*, Butterworth Heinemann, Boston, 2000.

Dixon, Nancy M., *The Organizational Learning Cycle: How We Can Learn Collectively*, Gower Publishing Limited, Hampshire, England, 1999.

Kaplan, Robert S., and Norton, David P., *The Strategy-Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment*, Harvard Business School Press, Boston, 2001.

Liautaud, Bernard, with Hammond, Mark, *E-Business Intelligence: Turning Information into Knowledge into Profit*. McGraw-Hill, New York, 2000.

Muoro, Anna, "Cisco's Quick Study," *Fast Company*, October, 2000.

Nonaka, Ikujiro, and Hirotaka, Takeuchi, H., *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York, 1995.

O'Dell, Carla, and Grayson, C. Jackson, Jr., *If Only We Knew What We Know: The Transfer of Internal Knowledge and Best Practice*, The Free Press, New York, 1998.

Saint-Onge, Hubert, "Building Capability through E-Learning: A Practitioner's Perspective", Clarica, Proceedings of the Delphi E-Learning Summit, Phoenix, Arizona, January, 2001.

Sheehan, Susan, "Turning the Ship While Moving Full-speed Ahead", EMC Corporation, Proceedings of the Delphi Group's E-Learning Summit, Phoenix, Arizona, January, 2001.

Sherman, Lu, "A Matter of Connections," *Knowledge Management Magazine*, 3, 7, p.43-47, July, 2000.

Stefanco, Douglas, "Workforce 2000 – Getting It done", KPMG Consulting, Proceedings of the Delphi Group's E-Learning Summit, Phoenix, Arizona, January, 2001.

Stewart, Thomas A., *Intellectual Capital: The New Wealth of Organizations*, Doubleday, New York, 1997.

Thornton, Mary Beth, "The Convergence of E-Learning and Knowledge Management at ACNielsen", ACNielsen, Proceedings of the Delphi Group's E-Learning Summit, Phoenix, Arizona, January, 2001.

Von Krogh, Georg, Ichijo, Kazuo, and Nonaka, Ikkujiro, *Enabling Knowledge Creation: How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*, Oxford University Press, New York, 2000.

Welsh, John F., Jr., (Jack), in GE Annual Report, General Electric Company, 1999.

Wenger, Etienne, and Snyder, William, “Communities of Practice: Key to Knowledge Strategy”, a presentation to the KM Working Group, a subcommittee of the Federal CIO Council, Washington, DC, December, 2000.

BIOGRAPHY

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